

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on August 8, 2003, and the references cited therewith.

Claims 1, 2 and 16 are amended. Claims 1-23 are now pending in this application.

§102 Rejection of the Claims

Claims 1-4, 16-19 and 22 were rejected under 35 USC § 102(b) as being anticipated by Bowers et al. (U.S. Patent No. 4,572,949). This rejection is respectfully traversed on the basis that Bowers et al. does not show each and every element of the claimed invention.

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *In re Dillon* 919 F.2d 688, 16 USPQ 2d 1897, 1908 (Fed. Cir. 1990) (en banc), cert. denied, 500 U.S. 904 (1991). It is not enough, however, that the prior art reference discloses all the claimed elements in isolation. Rather, “[a]nticipation requires the presence in a single prior reference disclosure of each and every element of the claimed invention, *arranged as in the claim.*” *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added).

Applicant respectfully submits that the Office Action did not make out a *prima facie* case of anticipation as Bowers et al. is lacking an element wherein the modulation signal is a function of the detector output. Independent claims 1 and 16 have been amended to include this element and are now believed to distinguish Bowers et al. Bowers et al. describes the use of a phase modulator driven at a fixed frequency ω_m . ω_m is only described in column 14 of Bowers et al. as being less than the frequency of the surface wave, such that upper and lower sidebands are created. The lower sidebands lie “in a range of frequencies to which the detector 28 is more sensitive...” Col. 14, lines 16-17. Thus, there is no need for control of the frequency, and therefore no need to provide a modulation signal that is a function of a detector output.

§103 Rejection of the Claims

Claims 20, 21, and 23 were rejected under 35 USC § 103(a) as being unpatentable over Bowers et al. Since claims 20, 21 and 23 depend from claim 16, which also references the use of the detector output to control the modulation signal, these claims are also believed allowable.

Claims 5-15 were rejected under 35 USC § 103(a) as being unpatentable over Bowers et al. in view of Strandjord (U.S. Patent No. 5,734,469). This rejection is respectfully traversed. These claims each depend from claim 1, and are believed allowable in view of the above remarks.

As there is no need to control the modulation signal in Bowers et al., as described above, there is no suggestion to combine Bowers et al. with Strandjord. The Office Action indicates that “It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Bowers by insuring that the modulating frequency, ω_m , is equal to the proper frequency of the sensor. Clearly to maintain the $\pi/2$ fixed phase shift between the two wavetrains of Bowers frequency ω_m must be the proper frequency.” This assertion is respectfully traversed. Bowers does not describe ω_m as being a proper frequency. As indicated above, it is merely a frequency that is less than the acoustic waveform frequency to provide a lower sideband. It has nothing to do with the path length. There is no need to track it and modify it. Strandjord merely controls the frequency to reduce the quadrature and keep the frequency at a proper frequency for the sensing coil. These are completely different purposes. The suggestion to combine is merely a conclusory statement of subjective belief, not supported by a suggestion from the prior art. As such, the rejection should be withdrawn.

Claim 7 indicates that the path length is computed as a function of the modulation signal. This is quite different than the references. Bower et al. maintains a constant frequency for the modulation signal. Strandjord does the same. It “controls the frequency of the bias phase modulator driver so as to reduce the quadrature to a minimum and to keep the modulator frequency at the proper frequency of the sensing coil.” Abstract. There is no indication in either reference that the length of the optical path is a function of the modulation signal.

Claim 8 further indicates that the modulation signal is maintained at a frequency such that the output intensity remains fairly constant. There is no teaching in the references of this feature. Claim 10 describes a ramp waveform. No such feature has been identified in the references.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6972 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 10 day of November, 2003.

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